Cumulative impact of hazard-based legislation on crop protection products in Europe

Final report

3 July 2016

steward redqueen

1 Summary

The viability of European agriculture has been put under pressure. As a result of the EU moving towards hazard-based legislations, several substances for plant protection used in the EU are at risk. While no definitive decision on which active substances are facing withdrawal has yet been made, earlier research identified some 75 out of the total 400 substances currently available to be phased out.

However, for the cultivation of various staples, as well as specialty crops, it is possible that no alternative method would remain on the market to treat specific common diseases, pests or weeds. As part of Integrated Pest Management (IPM), diversity in available substances is crucial for facing immediate pest pressure and preventing long-term resistance effects. Looking ahead, withdrawn substances are not likely to be easily replaced. There are two reasons for this: First, the development of new active ingredients up to market introduction takes about 11 years and costs over $280 million.[1] Second, the pipeline of products waiting for approval for the European market is also getting emptier due to rising Research and Development (R&D) time and costs (i.e. 70 substances in pipeline in the 2000, down to 28 in 2012).[2]

Against this background, this study aims to shed light on the current value of the 75 substances for European agriculture. It focuses on seven staple crops at the EU level and 24 specialty crops across nine EU member states, representing 49% (in crop value).[3] The various crops are studied individually; possible effects on pesticide use of specific crop rotations (or any significant change in the rotations) have not been taken into consideration. The analysis is based on five year average productivity and costs (2009-2013) in order to average out yearly variations:

- The team builds largely on the risk list of 87 substances that has been drafted by the Andersons Centre[4] with UK's Department for Environment, Food and Rural Affairs (DEFRA) as primary source. Twelve substances have been omitted from the study as these are based on UK-specific regulations or are considered low risk;
- We studied the nine largest EU agricultural markets (representing 62% of EU crop value of the staple crops[5]) and extrapolated these effects to the EU level;
- Within the nine countries studied, the crop coverage ranges from a minimum of 25% in the Netherlands up to 70% in France of national crop value;
- The selection of crops included in the scope of the study is based on relevance of various crops and data availability for the countries covered;

[1] Phillips McDougall, Agrochemical Research and development: The Costs of New Product Discovery, Development and Registration, 2016

[2] Phillips McDougall, R&D trends for chemical crop protection products, Sept 2013

[3] Total volume of EU crop output is €204bn, FAOSTAT

[4] "The Effect of the Loss of Plant Protection Products on UK Agriculture and Horticulture and the Wider Economy", The Andersons Centre supported by AIC, NFU, CPA; 2014. The Andersons Centre also draws on insights from the ADAS report on 'The Impact of Changing Pesticides Availability on Horticulture' from 2010. This study's methodology and substance list are in line with these previous analyses.

[5] Staple crops include: wheat, barley, maize, oilseed rape, potatoes, sugar beet and grapes. Specialty crops include: durum wheat, carrots, apples, beans, hops, onions, brassica, mushrooms, rice, tomatoes (open-air and greenhouse produces), pears, peaches/nectarines, soy, hazelnut, olives, tulip bulbs, apple trees, bell peppers, black currants, citrus fruits, cherries, sunflowers and peas for selected countries

- We use the best available national and EU databases on crop production and cost structures (e.g. EUROSTAT, FAOSTAT, FADN, WUR, Teagasc, DEFRA).

The study focus is the immediate effects on yields in line with both WUR 2008 and the Andersons Centre' study, and expected long-term (resistance) effects are stated separately.

Key findings

1. Use of the 75 substances identified for the production of seven key staple crops in the EU (potatoes, barley, wheat, sugar beet, rapeseed, maize and grapes) contributes to 96 million tons or €15bn in crop value:
   - Barley, wheat, rapeseed and maize could face 10-20% lower yields, while potatoes and sugar beets might decrease by up to 30-40%; grape yields with 20%;
   - At the current speed of technological progress, it would take 15-20 years to make up for this loss[6];
   - Higher yields and lower production costs for these crops support farmer income by €17bn (i.e. €15bn additional revenue, €2bn lower costs);
   - With the 75 substances, overall farm profitability is 40% higher (€17bn of a total of €44bn)[7];
   - In value, wheat benefits the most with €4bn of value, while sugar beet shows the largest profitability surplus (+100%);
   - The seven staple crops correspond to 1.2m direct jobs. Of these, 30% face a medium or high risk of job loss due to relatively 'thin' margins for these crops.

2. The 75 substances are crucial for the economic viability of the 24 specialty crops covered in the scope of this study:
   - The supported yields range from 40-100%, a total of 12 million tons[8];
   - The size of the crop protection toolbox of many specialty crops is already limited and is the key driver of the high potential for yield losses;
   - These 24 specialty crops relate to 300,000 direct jobs, of which almost 60% are at high risk of job loss due to relatively large loss of margins.

3. At current crop demand, the 75 substances support the EU's self-sufficiency for wheat, barley, potatoes and sugar beets, while limiting the import levels of rapeseed and maize:
   - In contrast to the current situation with a positive trade balance, without these 75 substances, the EU is likely to depend on imports for more than 20% of its staple crop demand;
   - Meeting the demand for staples with imported crops entails risk of selling crops on the European market produced with non-EU standards;
   - Meeting the demand for specialty crops seems even more challenging as sufficient import amounts are not always readily available;
   - An additional 9 million ha farmland might need to be integrated to feed Europe. This is equal to half of the total used agricultural area of the UK[9];

[6] "The technology challenge", FAO, High Level Expert Forum, 2009
[7] Profitability based on gross margin changes. Gross margin is defined as the difference of total revenues and total variable costs. The choice to report on gross margins has been made due to data availability: while the official sources on variable costs in various countries provide estimates in the same range information on fixed costs lack consistency
[8] Includes durum wheat, carrots, apples, beans, hops, onions, brassica, mushrooms, rice, tomatoes (open-air and greenhouse), pears, peaches/nectarines, soy, hazelnuts, olives, tulip bulbs, apple trees, bell peppers, black currants, citrus fruits, cherries, sunflowers and peas for selected countries
[9] Total used agricultural area in the UK was 17,326,990 ha in 2013, Eurostat

- This would increase the carbon emissions by up to 49 million t CO_2-eq (i.e. 10% EU agriculture, 1% of EU, similar to the total emissions of Denmark[10] or twice the international aviation emissions of Germany[11]), putting the CO_2 aims of European legislation at risk;[12]
- In monetary terms, these increases could mean additional emissions to the value of €500 million.[13]

4. Mediterranean crops analysed benefit from using the 75 active substances for protecting against a wide range of pest diseases. Most of these are specialty crops that currently benefit of a limited number of registered active substances:
   - The supported grape yields would decrease by 20% (22% in France, 13% Spain, 20% Austria and Italy even 30%) and overall farm profitability would be 11% lower;
   - The EU is currently self-sufficient for grapes. Losing the active substances will require the EU to import some 4m tons of grapes from third countries;
   - Yields are expected to decrease by 92% in carrots, 60% in apples, 65% in pears, 40% in olives, 36% in tomatoes, 36% in citrus fruits and 15% in cherries.

5. Smaller local crop supply will also affect EU value chains with higher costs and less jobs:
   - Primary crop processors in the EU could run into difficulties with their supplies, e.g. if tomatoes become economically unviable to be cultivated locally, the long-term perspective for the processors is uncertain;
   - Effects are likely to trickle down the value chain to the consumer but also to affect EU trading partners.

[10] Total Danish greenhouse gas emissions (including international aviation and excluding LULUCF) in 2013 were 57.1 million ton CO2eq., EUROSTAT
[11] German greenhouse gas emissions related to international aviation in 2013 were 25.7 million tons CO2eq., EUROSTAT
[12] Agriculture made up 10% of total European emissions in 2012 out of a total 4,683 million tons, EUROSTAT
[13] €10 per ton, average 2009-2013 ETS prices